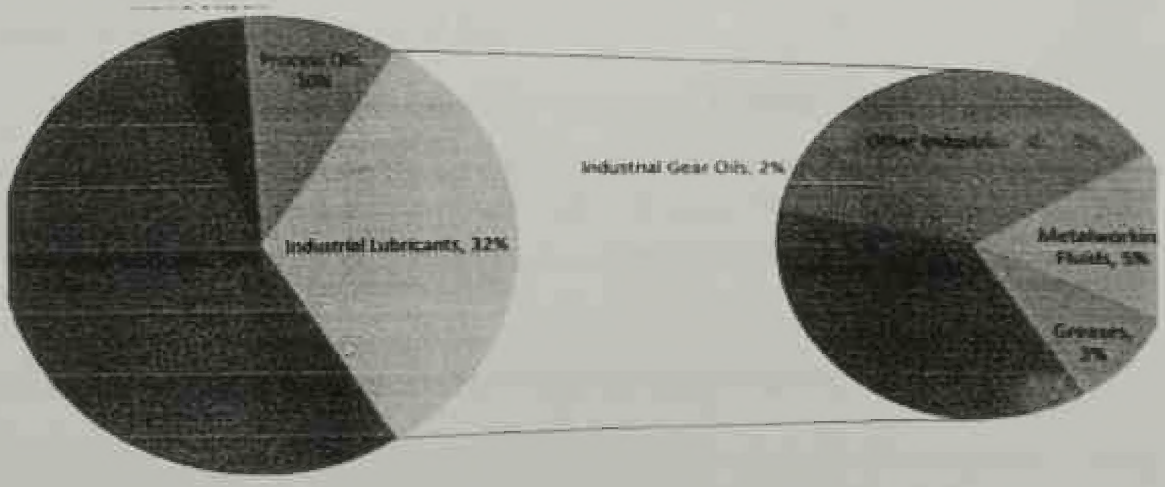
ECO FRIENDLY LUBRICANTS

INTRODUCTION

A lubricant is a substance introduced between two moving surfaces to reduce friction, minimize wear, distribute heat, remove contaminants, and improve efficiency.In 1979 it was estimated that over $200 billon was spent in North america on maintance. Within the $200 billion, approximately one third could have been avoided with the use of lubricants. More recently estimates the amount of energy wasted due to insufficent knowledge applied to the science of friction and were resulted in roughly 0.4% of the gross domestic product(GDP) being wasted .

With in the lubrication there are a vast number of applications which require specifically formulated lubricants that have given rise to upward of 10000 different lubricants that satisfy more than 90% of all lubricants applications to world wide. Figure 1.1 shows that the gobal lubrication market as of 2015 which consumed roughly 37.4 million tons of lubricants. Industrial lubricants amount to 32% and composed of hydroulic oils 10% other industrial oils, 5% metal working fluids, 3% greases, and 2% gear oil



MEANING OF LUBRICATION:

- Any material used to reduce friction is called a lubricant
- Resistance to motion is defined as friction
- Friction is created when there is relative motion between two surfaces
- Lubrication is use of a material between surfaces to reduce friction

TYPES OF LUBRICATION:

There are two main methods.

- Hydrodynamic lubrication
- Boundary lubrication

EXPLANATION OF HYDRODYNAMIC LUBRICATION:

- Also called complete or full flow
- Occurs when two surfaces are completed separated by a fluid film

EXPLANATION OF BOUNDARY LUBRICATION:

- Also called boundary film lubrication
- Occurs when fluid film doesn't develop between potentially rubbing surfaces.

There are many more types of lubricants :

- SOLID LUBRICANTS: e.g:-Wax, Talc, Mica, Molibdenum disulphide.
- SEMI SOLID LUBRICANTS: e.g:-Grease and Vaseline.
- LIQUID LUBRICANTS: e.g:-Mineral oils, vegetable oils, animal oils.
- SYNTHETIC LUBRICANTS: e.g:-Polyglycols, silicons, organic amines, imines, amides.

REGENERATION OF USED ECO FRIENDLY LUBICATING OILS

The used eco friendly lubracting oil can be regenerated by using various process

- Centrifugal separation
- Magnetic separation
- Vacuum distillation

AIM and OBJECTIVES

AIM: To determination of selected lubricant breeds.

OBJECTIVE: Determining and analysing the factor responsible for the breeds in diesel engine oil (DEO) and car motor oil(CMO) and four stroke oil(4T) segment based on suggestions obtained from shops and retail outlets through the document. Further giving possible suggestions in Hindustan petroleum corporation limited(HPCL). To gain a competitive edge in its shops and retail outlets.

- To poetry the lubricants market in India its historical background.
- To identify the successfull lubricant brands launched by Hindustan petroleum corporation limited(HPCL), Bharath petroleum corporation limited(BPCL), Indian oil corporation limited and Castrol Indian limited(ICIL)
- To identify the brand success factors of selected lubricant brands launched by Hindustan petroleum corporation limited(HPCL),bharath petroleum corporation limited(BPCL), Indian oil corporation limited (IOCL), and CASTROL

FUNCTIONS OF ECO FRIENDLY LUBRICANTS:

- It acts as thermal barrier and reduces friction and prevents welded joins
- Avoids scizure of moving surfaces
- Acts as coolants
- Acts as a seal and prevents entry of dust, moister, & dirt moving parts

Some lubricants acts as corrosion inhibitors thus reduce operational cost.

- Eco friendly micro emulsion
- Eco friendly aqueous deforming fluid

RESULTS FOR LUBRICANTS

s.no	LUBRICANT TYPE	PRIMARY BIODEGRADED QUANTITY
1	Vegetable oils	70 - 100%
2	Polyols and diesters	55 - 100%
3	White oils	35 - 45%
4	Mineral	15 – 35%
5	Pag	10 – 30%
6	Pao	5 – 30%
7	Poly ether	0 – 30%

COMPOSITION OF GREASE TO OIL

ADVANTAGES OF GREASE :

- It is placed easy to control excellent sealing capability and can be used as part of a moisture and dirt
- Can withstand heavy shock loads
- Requires less frequent application than oil-better for remote locations and occasional use baring

DIS-ADVANTAGE OF GREASE:

- Has a lower temperature then oil,can cook and harden in bearing in high temperature applications
- Contaminants from poor manual greasing process will not settle out and can harm bearing
- Grease lubricants bearings consume more energy to overcome grease fluid friction
- Requires greater pump pressure and line size to move grease around in centralized systems
- Total loss only lubrication

- Solid lubruicants such as poly tetra fluro ethylene(PTFE), hexagonal boran nitride and tungsten disulfide are examples of materials that can be used as solid lubricants, often to very high temperature

LUBRICANT OIL TYPES

- Lubricants today are classified into two groups

1) Automotive lubricants
2) Industrial lubricants

- Industrial lubricants can be sub divided into industrial oils and industrial specialties, greases, metal working lubricants and solid lubricants films
- The industrial lubricants category includes the following types : hydraulic , cutting , metal working, electrically and process oil

LUBRICANT OIL COMPOSITION

- Lubricating oils from petroleum consists essentially of complex mixture of hydro carbon molecules
- They are mostly composed of iso alkanes having slightly longer branches which have several short branches
- This hydro carbon molecules generally range from low viscosity oils having molecular weight as low as 350, upto very viscous lubricants with molecular weight as high as 1000

EXAMPLE PRODUCTS OF ECO FRIENDLY LUBRICANTS

The products belongs to the eco friendly range of products designed from renewable materials by MOLYDAL. It comples with the environmental security to the end users. The products are

- Biodegradable vegetable oil and synthetic ester based grease
- Green based hydraulic oil
- Voc-free degrasing agent safe cold degrasing agent for industrial use
- Emulsifiable clearing and degrasing fluid that removes bitumen and tar
- Green based extreme pressure oil for cutting and drawing operations
- Green based extreme pressure oil for cutting and deep drawing operations

PROPERTIES OF ECO FRIENDLY LUBRICANTS

A good lubricant generally posses the following characteristics:

- High boiling point and low freezing point (In order to stay liquid within a wide range of temperature)
- High viscosity index
- Thermal stability
- Hydraulic stability
- Demulsibility
- Corrosion prevention
- High resistance to oxidation

ECO SAFE ADVANTAGES OF LUBRICANTS

- Base oil derived from vegetables but not from petroleum
- It will be safer around the word place, home, family and pets
- There will not be any harsh smell
- Non toxic
- There will be no zinc, chlorine

ECO FRIENDLY ADVANTAGES OF LUBRICANTS

- Renewable resource
- By-products returned to food chain
- Bio degradable lubricant
- Reduces dependency on foreign oils
- Neutral in water so it won't pollute rivers ,streams etc
- Replaces and mixes readily with petroleum based products

CLASSIFICATION OF ECO FRIENDLY LUBRICANTS:

- Liquid lubricants or lubricating oils such as gear oil, bearing oil, hydraulic oil etc
- Semi-solid lubricants or greases

ADVANTAGES OF OIL:

- The most effective lubricant
- Excellent cleaning especially in recirculative system
- Requires lower pressure
- Can be used in recirculative system
- When it is correct application no limit to mission speed
- It is used within centralised systems
- It is more generally stable than Grease

DIS ADVANTAGES OF OIL:

- It is more difficult to control at bearing surface area
- It requires mechanical seals(e.g- radial lip seal) to control the leakage

CONCLUSION

The use of petroleum based oils as coolant and lubricant have become more problematic in terms of both employ health and environmental pollution the use of vegetable oils as cutting fulid play an important role in this regards some other fluids such as liquid nitrogen, carbon dioxide, liquid water vapour are also the best use of petroleum based synthetic oils. A new cooling system that ionized air cooling system is one of the best example

- The concept of eco friendly lubricant products from start to finish has come about it involves considering the ecologically dimension of the entire production process from the fibre to the finished product including manufacturing process write the way through to recycling the product at the end of its period
- Maintaining of high product in cost effective manner
- Improved functionality

- Lower generation of aqueous waste and off gases
- Minimum use of water and chemicals
- Over all environment friendliness
- Reduce water and energy consumption during preparation and finishing
- Improve process efficiency
- Reduce exposure to chemicals

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